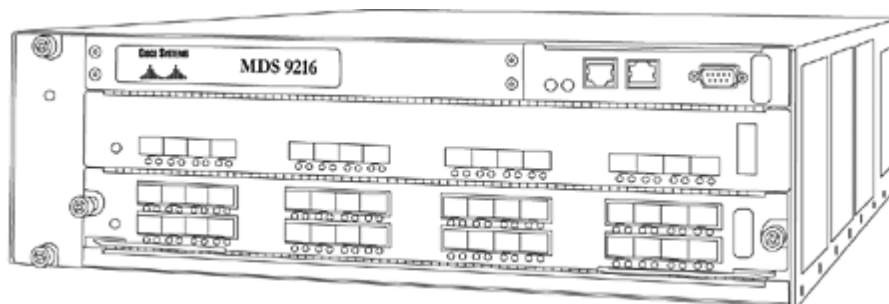*Overview*

The Cisco MDS 9216 Multilayer Fabric Switch shares a consistent architecture with the MDS 9509 Director and offers the same multilayer intelligence in a modular fabric switch. Intelligent features include multi-protocol support (Fibre Channel, iSCSI, FCIP), Virtual SANs (VSANs), embedded diagnostics and role-based security. With these innovations, companies can build highly scalable, available storage networks with comprehensive security and unified management.

The MDS 9216 is fully populated out of the box with sixteen 1 and 2 Gb auto-sensing Fibre Channel ports. An expansion slot allows for the addition of an MDS 9000 port card available in 16 or 32 ports, for up to 48 Fibre Channel ports or an MDS9000 IP Storage Service Module for FC/iSCSI connectivity. MDS 9000 port cards and IP Storage Service Modules are interchangeable between the MDS 9216 Fabric Switch and MDS 9500 series directors, providing smooth migration, common sparing and investment protection.

Layered, intelligent features also include integration with HP OpenView Storage Area Manager (SAM) and CiscoWorks RME, delivering ease of administration, improved customer productivity, and infrastructure management through a single pane-of-glass. This common software platform also ensures that the user's SAN environment will scale seamlessly as business grows.

Key Features and Benefits

- **Reduced Total Cost of Ownership (TCO) for SAN Infrastructure**
  - Enables storage consolidation, simplified management of SAN environment
  - Integrates Fibre Channel, iSCSI, and FCIP in one system
- **High Port Density**
  - 16 48 Fibre Channel ports (auto-sensing 2/1 Gb) in single chassis
  - Up to 8 1 Gb Ethernet ports in a single switch (configurable for iSCSI or FCIP)
- **Scalable**
  - Supports throughput up to 32 Gb in a single PortChannel ISL
  - 2 slots; 1 optional for MDS 9000 Series modules
- **Highly Available**
  - Redundant power supplies and fans for high availability - Hot-swappable SFP optical interface modules, fan modules, and power modules
- **Interoperable**
  - Broad range of HP servers and operating systems
  - Disk and tape storage devices
  - Open platform for hosting 3rd party storage applications, such as virtualization
- **Integrated Management**
  - Embedded Fabric Manager
  - Integration with HP OpenView Storage Area Manager (SAM)
  - Integration with CiscoWorks Resource Manager Essentials (RME)

Models

Cisco MDS 9216 Multilayer Fabric Switch	Cisco MDS 9216 **NOTE:** Chassis ships with one modular expansion slot; includes 16 Fibre Channel ports populated with short wave SFPs, RJ-45 10/100 Ethernet management port, RJ-45 console port, and DB-9 COM port; also includes software image, dual power supplies, power cords, fan modules, and 19-inch mounting rack kit.	A7473A

QuickSpecs

Product Highlights

Cisco MDS 9216 Multilayer Fabric Switch	Supports from 16 to 48 Auto-Sensing 2 / 1-Gb Auto-Sensing Fibre Channel ports and up to 8 1-Gb Ethernet ports (user configurable for iSCSI or FCIP) in a single switch.
Network-based Intelligent Storage Applications	• Virtualization • Data replication • Back-up
Security	Supports role-based access control, VSANs, hardware-enforced Zoning, FC-SP, ACLs, RADIUS authentication, SNMPv3, SSH, and SFTP.
Intelligent network services	• Virtual SANs (VSANs) • PortChannels • Quality of Service (QoS) • Security • Embedded Diagnostics
High Availability	Full redundancy of all major components for availability.
Multiprotocol/ Multitransport	• Enables a consistent feature set over a protocol agnostic switch fabric • Seamlessly integrates Fibre Channel, iSCSI, and FCIP in one system • Allows integration of future storage protocols with its flexible architecture
Embedded Diagnostics	Provides industry-first intelligent diagnostics, including Fibre Channel ping and trace route, SPAN, protocol analysis and decoding, Zone and VSAN merge analysis, and integrated Call Home capability.
PortChannels	Allows users to aggregate up to 16 physical links into one logical bundle. The bundle can consist of any port in the chassis, ensuring that the bundle remains active in the event of a port, ASIC, or module failure. The bundle can sustain the failure of any physical link without causing a reset. Additionally, Fabric Shortest Path First (FSPF) multipathing provides the intelligence to load balance across up to 16 equal cost paths and, in the event of a switch failure, to dynamically reroute traffic.
Access Control Lists (ACLs)	Hardware-based intelligent frame processing.
Traffic management	• Fibre Channel Congestion Control (FCC) • Fabric-wide QoS
Management modes	• Cisco MDS 9000 Family Command Line Interface (CLI) • Cisco Fabric Manager • Integration with HP OpenView Storage Area Manager (SAM) • Integration with Cisco Resource Manager Essentials (RME)

Product Highlights

Interoperability	• Offers compatibility with a broad range of HP servers and operating systems, as well as disk and tape storage devices • Shares common architectural platform across all Cisco MDS 9500 Series Directors and Cisco MDS 9216 Multilayer Fabric Switch • Interchangeable modules across Directors and Fabric Switches

Product Family Models
- Cisco MDS 9506 Multilayer Director
  - Intelligent, multi-protocol 6-slot Director with up to 128 Auto-Sensing 2/1 Gb Fibre Channel ports
- Cisco MDS 9509 Multilayer Director
  - Intelligent, multi-protocol 9-slot Director with up to 224 Auto-Sensing 2/1 Gb Fibre Channel ports
- Cisco MDS 9216 Multilayer Fabric Switch
  - Intelligent, multi-protocol modular Fabric Switch with up to 48 Auto-Sensing 2/1 GbFibre Channel ports
- Cisco MDS 9120 Multilayer Fabric Switch
  - Intelligent, Fibre Channel Fabric Switch with 20 Auto-Sensing 2/1 Gb Fibre Channel ports
- Cisco MDS 9140 Multilayer Fabric Switch
  - Intelligent, Fibre Channel Fabric Switch with 40 Auto-Sensing 2/1 Gb Fibre Channel ports<

Software Components, Standard

SAN-OS

Cisco MDS 9000 SAN-OS delivers numerous advanced storage networking capabilities for the Cisco MDS 9000 Family of Multilayer Intelligent Directors and Fabric Switches.

Cisco Fabric Manager

Cisco Fabric Manager is a responsive, easy-to-use Java application that simplifies management across multiple switches and fabrics. Cisco Fabric Manager enables administrators to perform vital tasks such as topology discovery, fabric configuration and verification, LUN security, monitoring, and fault resolution. All functions are available through a secure interface, which enables remote management from any location. Cisco Fabric Manager may be used independently or in conjunction with third-party management applications. Cisco provides an extensive API for integration with third-party and user developed management tools.

Service and Support, HP Care Pack and Warranty Information

Warranty	(1-1-1) Hardware Warranty; 1-year parts; 1-year on-site (8x5, next business day response) and 1-year labor.

NOTE: The hardware warranty covers firmware and embedded non-saleable software. For additional hardware installation and hardware information, please refer to the URLs listed below:
English: http://www.compaq.ca/English/service/cusserv/carepaq/carepaq.htm
French: http://www.compaq.ca/Francais/service/ccs/carepaqf/carepaqf.htm

NOTE: For details, consult the Product Information Centre at 1-888-882-6672.

Hardware or Software product installation is not included in the warranty, but is available and highly recommended.

HP Service & Warranty Support

HP Service & Warranty Support Additional Warranty protection and/or HP Installation packages can be purchased.
NOTE: Certain restrictions and exclusions apply. For details, consult the Product Information Centre at 1-888-882-6672. HP provides a one-year, hardware limited warranty, fully supported by a worldwide network of resellers and service providers.

In addition, available service offerings include a full range of HP Care Pack packaged hardware and software services:

- Installation
- Extended coverage hours and enhanced response times
- System management and performance services
- For more information on warranty and support options, please visit our Web site at: http://www.hp.com/hps/tech/storage/supp/.

Software Product Services

Software Warranty - HP warrants only that the software media will be free of physical defects for a period of ninety (90) days from delivery.

EXCLUSIVE REMEDY -The entire liability of HP and its suppliers and your exclusive remedy for software that does not conform to this Limited Warranty shall be the repair or replacement of the defective media. This warranty and remedy are subject to your returning the defective media during the warranty period to HP in the country in which you obtained the software.

NOTE: Certain restrictions and exclusions apply. For details, consult the Product Information Centre at 1-888-882-6672.

Hardware or Software product installation is not included in the warranty, but is available and highly recommended.

Hardware Product Services

(1-1-1) Hardware Warranty; 1-year parts; 1-year on-site (8x5, next business day response) and 1-year labor.
NOTE: The hardware warranty covers firmware and embedded non-saleable software. For additional hardware installation and hardware information, please refer to the URLs listed below:
English: http://www.compaq.ca/English/service/cusserv/carepaq/carepaq.htm
French: http://www.compaq.ca/Francais/service/ccs/carepaqf/carepaqf.htm

QuickSpecs

Service and Support, HP Care Pack and Warranty Information

HP Care Pack Services Warranty Upgrade Options

Service offerings include a full range of Customer HP Care Pack services for both hardware and software services:

- Response - Upgrade on-site response from next business day to same day 4-hours
- Coverage - Extend hours of coverage from 5 days x 9 hours to 7 days x 24 hours
- Duration - Select duration of coverage for a period of 1, 3, or 5 years
- Additional Warranty protection and/or HP Installation packages can be purchased.

NOTE: Certain restrictions and exclusions apply. For details, consult the Product Information Centre at 1-888-882-6672.

HP Care Pack Information HP Care Pack is defined as an upgrade to the product warranty attribute, available for a specific duration and hours of coverage.

- HP Care Pack is not available for less than the product's warranty duration.
- HP Care Pack is available for sale anytime during the warranty period for most products, but the commencement date will be the same as the Warranty Start Date (delivery date to end user customer). Proof of purchase may be required.
- HP Care Pack services are prepaid.
- For additional HP Care Pack (hardware & software) information, as well as orderable part numbers, please refer to the URL listed below:
  http://h18005.www1.hp.com/services/carepaq/index.html

Additional Services

Installation service; SAN Solution service; SAN-Environmental Support service; SAN Architecture service; Proactive 24
For more information on these and other service options, please contact any of our worldwide sales offices or visit our Web site at:http://www.hp.com/hps/support

Family Information

	Cisco MDS 9216	Cisco MDS 9509	Cisco MDS 9506	Cisco MDS 9120 & 9140
Introduction Date	June 2003	June 2003	September 2003	September 2003
Switch Type	Multilayer Fabric Switch	Multilayer Director	Multilayer Director	Multilayer Fabric Switch
Maximum ports	48 Fibre Channel, 8 IP ports	224 Fibre Channel, 48 IP ports	128 Fibre Channel, 24 IP ports	20 or 40 Fibre Channel ports
Number of slots per chassis	Two	Nine	Six	N/A, Fixed FRU

QuickSpecs

Configuration Information

Step 1 – Base Configuration

Select one:

Model	Model Description	Part Number
Cisco MDS 9216 Multilayer Fabric Switch	Cisco MDS 9216	A7473A

NOTE: Chassis ships with one modular expansion slot. Includes 16 Fibre Channel ports populated with short wave SFPs, RJ-45 10/100 Ethernet management port, RJ-45 console port, and DB-9 COM port; also includes software image, dual power supplies, power cords, fan modules, and 19-inch mounting rack kit.

Step 2 – Options

Select each type of required options with quantities specified:

Model Description	Quantity	Part Number
Cisco MDS 9000 Series 16-port card, 16 short wave SFPs (A7428A) included*	1 Max	A7464A
Cisco MDS 9000 Series 32-port card, 32 short wave SFPs (A7428A) included*	1 Max	A7465A
Optical Transceiver, Small Form Factor Pluggable, Short Wave		A7428A
Optical Transceiver, Small Form Factor Pluggable, Long Wave		A7429A
FCIP & iSCSI Solution		
MDS 9000 IP Storage Services Module	1 Max	A7470A
MDS 9200 FCIP Services Software License**	1	A7474A
1 GB Ethernet & 1-2 GB short wave SFP, LC		A7487A
1 GB Ethernet & 1-2 GB long wave SFP, LC		A7488A
Course Wave Division Multiplexer Solution		
4 Wavelength Add/Drop Mux, w/Chassis		A7483A
8 Wavelength Mux/Demux, w/Chassis		A7484A
1470 NM CWDM FC SFP		A7475A
1490 NM CWDM FC SFP		A7476A
1510 NM CWDM FC SFP		A7477A
1530 NM CWDM FC SFP		A7478A
1550 NM CWDM FC SFP		A7479A
1570 NM CWDM FC SFP		A7480A
1590 NM CWDM FC SFP		A7481A
1610 NM CWDM FC SFP		A7482A
Fibre Cable LC/SC 1 Meter		A7485A
Fibre Cable LC/SC 5 Meter		A7486A

NOTES: * Fibre Channel ports on the MDS 9000 port cards may be configured to accept either Short Wave SFP or Long Wave SFP optic transceivers but are shipped populated with short wave SFPs. ** Required for FCIP operation with MDS 9000 IP Storage Service Module

Configuration Information

Step 3 – Additional Options

		Part Number
Installation Service	Cisco MDS 9216 Installation Service	HA113A1 #5D2
Optical Cables	*Recommended Cables*	
	(LC-LC for between two 2 Gb devices)	
	2 m LC-LC Multi-Mode Fibre Channel Cable	221692-B21
	5 m LC-LC Multi-Mode Fibre Channel Cable	221692-B22
	15 m LC-LC Multi-Mode Fibre Channel Cable	221692-B23
	30 m LC-LC Multi-Mode Fibre Channel Cable	221692-B26
	50 m LC-LC Multi-Mode Fibre Channel Cable	221692-B27
	(LC-SC for between a 1 Gb and a 2 Gb device)	
	2 m LC-SC Multi-Mode Fibre Channel Cable	221691-B21
	5 m LC-SC Multi-Mode Fibre Channel Cable	221691-B22
	15 m LC-SC Multi-Mode Fibre Channel Cable	221691-B23
	30 m LC-SC Multi-Mode Fibre Channel Cable	221691-B26
	50 m LC-SC Multi-Mode Fibre Channel Cable	221691-B27

Fibre Channel standards and revisions	Fibre Channel Protocols (FC-PH, Revision 4.3, FC-PH-2, Revision 7.4 FC-PH-3, Revision 9.4, FC-SW-2, Revision 5.3, FC-SB-2, Revision 2.1,	FC-GS-2, Revision 5.3, FC-GS-3, Revision 7.01, FC-FLA, Revision 2.7, FC-FG, Revision 3.5,	FC-AL, Revision 4.5, FC-AL-2, Revision 7.0 , FC-PLDA, Revision 2.1, FC-VI, Revision 1.61, FCP, Revision 12, FCP-2, Revision 7a,	FC-BB, Revision 4.7, FC-FS, Revision 1.7, FC-PI, Revision 13 , FC-MI, Revision 1.99, FC-Tape, Revision 1.17)

Technical Specifications

Diagnostics		• Power-On Self Testing POST • Error detection, fault isolation, parity checking, illegal address check • Remote diagnostic through Call Home troubleshooting features • Displayed LEDs • Redundant Power Supply
Compatibility	Fibre Channel protocols	Fibre Channel Protocols (FC-PH, Revision 4.3, FC-PH-2, Revision 7.4 FC-PH-3, Revision 9.4, FC-GS-2, Revision 5.3, FC-GS-3, Revision 7.01, FC-FLA, Revision 2.7, FC-FG, Revision 3.5, FC-SW-2, Revision 5.3, FC-AL, Revision 4.5, FC-AL-2, Revision 7.0 , FC-PLDA, Revision 2.1, FC-VI, Revision 1.61, FCP, Revision 12, FCP-2, Revision 7a, FC-SB-2, Revision 2.1, FC-BB, Revision 4.7, FC-FS, Revision 1.7, FC-PI, Revision 13 , FC-MI, Revision 1.99, FC-Tape, Revision 1.17)
	Classes of service	Class 2, Class 3, Class F
	Port types	• E, F, FL standard • SD, TE, TL enhanced
	Internet standards	• RFC 791 IPv4, RFC 793, 1323 TCP, RFC 894 IP/Ethernet, RFC 1041 IP/802, RFC 792, 950, 1256 ICMP, RFC 1323 TCP performance enhancements, RFC 2338 VRRP • Extensive IETF-standards based TCP/IP, SNMPv3, and RMON MIBs
	IP over Fibre Channel	RFC 2625
	O/S Support	MDS SAN-OS Release 1.0 (1)
Performance	Transfer Rate	2 Gb / FC port
	Devices/Ports	• 48 FC ports • 1 10/100 Mb Ethernet ports

	Interface	• 1/2 Gb FC ports
		   ○ 10/100 Mb Ethernet port (management)
		   ○ RS-232 RJ-45 console port
		   ○ DB-9 COM port

Connectors/Cables	Connectors	• RJ-45 Interface Cable Connector • LC-type-fiber optic SFP
	Cables	• RJ-45 to RJ-45 rollover cable • RJ-45 to DB-25 female DTE adapter (labeled "Terminal ") • RJ-45 to DB-9 female DTE adapter (labeled "Terminal ") • RJ-45 to DB-25 male DCE adapter (labeled "Modem") • LC-type cable
	Cable Lengths	2 metres, 5 metres, 15 metres, 30 metres, 50 metres
Dimensions	Height - Tower	5.25 in (64.8 cm)
	Width - Tower	17.25 in (43.1 cm)
	Depth - Tower	22.75 in (46.0 cm)
	Depth - Chassis	21.64 in (55.0 cm), including cable guide Requires 3 RU
	Shipping	11 x 23 x 29.5 in (27.94 x 58.42 x 74.93 cm)
	Weight	• Chassis with two 845W Power Supplies: 49 lb (22.2 kg) • Chassis fully configured with one supervisor module, one switching module, and two power supplies: 65 lb (29.25 kg) • Include out-of-box weight and shipping weight

Technical Specifications

Environment	Non-operating Temperature	-40 to 158°F (-40 to 70°C), ambient non-operating and storage	
	Non-operating Humidity	5 to 95%, ambient (non-condensing) non-operating and storage	
	Operating Temperature	32° to 104° F (0° to 40° C), ambient operating	
	Operating Humidity	10 to 90%, ambient (non-condensing) operating	
Electrical	Nominal Line Voltage	100 to 240 VAC	
	Range Line Voltage	100 to 240 VAC (±10% for full range)	
	Line Frequency	50 to 60 Hz (nominal) (±3% for full range)	
	Typical Input Current	12A @ 100VAC, 6A @ 240 VAC	
	Power	845W AC; plug types: Argentina IRAM 2073 (10A), North America (1000W power supply) NEMA 5-15P (15A), Australia, New Zealand SAA/3 AS/NZZS 3112-1993 (15A), Europe VIIG CEE (7)VII (16A), Italy 1/3/16 CEI 23-16 (16A), United Kingdom BS89/13 BS 1363/A (13A; replaceable fuse)	
	LED Indicators (On front panel)	Generic	• System • Ethernet (management)
		Fan	Fan status
		Switching Module	• Status • Speed • Link
		Power Supply	• Input OK • Output OK • Output Fail
UPC Code	808736907835		